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ABSTRACT

Fred N. Kerlinger has been hailed as having contributed to the transformation of the way that behavioral scientists and educators read research reports, design and execute research, and draw conclusions about research. In 1960 he introduced the notion that educational research is fraught with mythology. Three of the research myths that he described were: "methods," "practicality," and "statistics." The methods myth is centered about the misperception that research design is synonymous with research methodology. In correct practice, researchers should be more concerned with determining the methods of observation, measurement, and analysis that will help in developing and testing theory. The practicality myth is characterized by a preoccupation with the usefulness (payoff) when designing, conducting, or evaluating research. The actual objective of educational research is the advancement of theory. The statistics myth, although not precisely defined by Kerlinger, appears to relate to a fundamental disregard for statistics as an informational and methodological tool and a failure to understand that research design and statistical analysis are intimately related. Thoughtful researchers must move beyond these myths to conduct appropriate research and interpret it correctly. (Contains 16 references.) (SLD)

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Kerlinger's Research Myths

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Fred N. Kerlinger has been appropriately hailed as having *"contributed to the transformation of the way behavioral scientists and educators read research reports, design and execute research, and draw conclusions and implications from their findings"* (Pedhazur, 1992, p. 45). In 1960, he introduced the notion that educational research is fraught with mythology, that is *"a body of legends and beliefs purporting to be the rationale, purpose, and methods of educational research"* (p. 149). Three of the research myths pertained to *"methods," "practicality,"* and *"statistics."* In discussing these myths Kerlinger leveled honest, and often blunt, criticisms toward the educational research community. Nevertheless, he possessed an unflinching optimism as he contemplated the future of educational research, predicting a progression toward excellence in the practices employed by the next generation of researchers.

Three of these research myths Kerlinger discussed were *"methods," "practicality,"* and *"statistics."* This digest will examine these myths and discuss whether educational research still contains deleterious mythological perceptions and practices.

The Methods Myth

The methods myth (Kerlinger, 1960) is centered about the naive misperception that research design is synonymous with research methodology. Becoming an educational researcher simply involves learning about methods for collecting and analyzing data. In correct practices, the researcher should not be so much concerned with determining *"whether this method or that method should be used"* (Kerlinger & Pedhazur, p. 450). Instead, the researcher should be concerned with answering the important questions of *"which methods of observation, measurement, analysis--help the development and testing of theory?"* (ibid).

Unfortunately, the methods myth tends to perpetuate itself as commonly-used educational research textbooks generally emphasize methods over design (Kerlinger, 1960). As the *"professors of the next generation are selected from the doctoral students of this generation"* (p. 151), the currently used textbooks will influence how the future professors will teach and what they will teach about educational research. Hence, researchers pass on from generation to generation the tradition of blindly applying "standard" data collection and analytic strategies without regard for larger research design issues.

The Practicality Myth

Initially conceptualized as an *"overconcern with practicality"* (Kerlinger, 1959, p. 282) and later designated as the *"pragmatic-practical misconception"* (Kerlinger, 1977), the practicality myth is characterized by a preoccupation with usefulness (i.e., expectation of an immediate "payoff") when designing, conducting, or evaluating research. Researchers motivated by this myth would erroneously view the identification and solution of practical problems in education as the general purpose of educational research. However, *"the solution of a research problem is on a different level of discourse than the solution of an action problem"* (Kerlinger, 1979, p. 288). The actual objective of educational research is the advancement of theory. Although the advancement of theory can lead to the solution of practical problems, educational research should not be primarily driven by the desire to resolve specific difficulties.

The educational community and educational policy makers have historically favored and continue to favor research that has immediate practical implications (Kaestle, 1993; Kerlinger 1969, 1977, 1979). Hence, there has generally been a bias toward educational research projects with a practical focus (Kerlinger, 1959). Critics of basic research (e.g. Ebel, 1973) have argued that basic research promotes the virtue of uselessness and offers little hope for the improvement of the process of education. Nevertheless, basic research is more promising than applied research as a means for understanding educational phenomena (Kerlinger, 1959, 1969).

The Statistics Myth

While Kerlinger never indicated what precisely he meant by the "statistics" myth, a critical analysis of his writings would indicate he may have intended to use the term to denote at least two distinctive, though related problems: a) a fundamental disregard for statistics as an informational and methodological tool (Statistics Myth I) and b) a failure to understand that research design and statistical analysis are intimately related (Statistics Myth II).

Adherents to Statistics Myth I view statisticians as methodological shamans who *"perform complex and abstruse operations with numbers derived in mysterious ways"* (Kerlinger, 1979, p.81), with the result being a multifarious series of numerical abstractions that have little or nothing to do with reality. They also are prone to believe that behavioral constructs cannot and should not be quantified. Nevertheless, the purpose of behavioral statistics is not to attempt to mirror the reality of any particular individual within a given data set, but instead its purpose is to help researchers understand and interpret sets of data (Kerlinger, 1979).

Statistics Myth II assumes that the researcher and the statistician are two different (and unrelated) persons, and that forethought as to what statistical procedures will be utilized to analyze the data from a study is unnecessary. This myth causes researchers to settle for less sophisticated data analytic methods

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and/or do a poor job of interpreting the results of the methods they use. Additionally, limited knowledge of basic statistical concepts can also lead to inappropriate interpretations of statistical results (Tate, 1965). Chief among these misinterpretations of statistical results is the common misunderstanding of statistical significance testing, the assumption that a statistically significant result is necessarily a noteworthy result.

All statistical methods have certain inherent strengths and limitations, and each method implies certain assumptions about the data being analyzed. Because of this, statistical methods are very likely to influence both the nature and selection of research problems to some degree (Kerlinger, 1969, 1986; Kerlinger & Pedhazur, 1973). Therefore, it is imperative that researchers give considerable attention to the selection of statistical methods; these decisions will help direct the research.

Status of the Myths in Current Research Practice

A substantial move has been made towards eradicating the methods myths, at least in regards to using the correct structural framework. The curricula in educational graduate programs indicate that, at least structurally speaking, research design serves as the foci of the various "methodology" courses. Additionally, most "educational research" or "social science statistics" textbooks anchor their discussion of methodological issues within the framework of research design.

Despite these advances in educational research curriculum and course materials, considerable evidence shows that the previously noted problems associated with the misapplication of methods are not defunct. Studies of educational dissertations have consistently found numerous instances of inappropriate or indiscriminate applications of methodological procedures (cf. Eason & Daniel, 1989).

Unfortunately, the practicality myth seems to be very prevalent in society. Even though educational research is probably more theory driven than it has been in past years, the public's quest for accountability frequently demands that there be an immediate and measurable payoff when efforts and money are expended. Policy makers still criticize and often fail to adequately fund educational research and development because there is no immediate payoff (Kaestle, 1993). Policy makers also frequently complain that research is not practical and should not be trusted because it is too confusing (Cooper, 1996). Hence the lure of practicality still serves as *"a social norm, a rule of proper educational research behavior, that tends to force the scientist away from the really significant scientific problems in education"* (Kerlinger, 1959, p. 286).

The basic misconception that statistical information is mysterious and difficult to understand remains a problem (Holmes, 1990). An awe and fear of statisticians causes many to either put blind faith in those who are expert in statistics (Holmes, 1990) or to doubt the validity of statistical claims (Kerlinger, 1979). Many also believe that statistical analysis cannot be trusted and that statistics is too rife with technical jargon to be of any practical use (Sprinthall, 1990). Nevertheless, there has been some progress made towards discrediting the assumption that research design and selection of statistical procedures are unrelated processes (statistics myth II). Studies of methodological practices employed in published research (e.g. Crandall, 1982) have indicated that the appropriate application of multivariate statistical methods has increased over time. Unfortunately, these studies have also identified other types of methodological problems that are still quite prevalent in research practices.

Conclusion

Despite Kerlinger's bright hopes for the future, he also foresaw the stalwart nature of the myths, noting that the mythology of educational research "has an essentially mystical character which seems to be rooted to the past. To question the mythology amounts to heresy" (Kerlinger, 1960, p. 149). Even though educational research in the 1990s is not "myth free," thoughtful researchers are willing to commit "heresy," working both individually and collectively to deal with the problems inherent to the presence of the myths.

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